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2012 Report on Pesticide Incidents

Canada

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1.0 Executive Summary

Health Canada's Pesticide Incident Reporting Program has been collecting incident reports since April 2007. Incident reports are vital for detecting adverse effects, including those that are not evident during the initial registration of a pesticide. Health Canada assesses the reports to identify and characterize potential risk to humans, domestic animals and the environment from the use of pesticides. Assessments may lead to risk mitigation and management options, such as changes to how a pesticide is manufactured, packaged or used.

In 2012, 1960 pesticide incidents were reported to the Pest Management Regulatory Agency (PMRA). Most incidents were categorized as domestic animal incidents followed by human, environment, packaging failure and scientific study incidents. The majority of the effects reported were minor in nature.

Assessment of the incidents reported in 2012 led to several actions being taken by the PMRA. These include the revision of label instructions, development of best practices to reduce exposure of bees to dust generated during planting of treated seed, and continued monitoring of adverse effects related to particular pesticides.

Monitoring incidents for unanticipated effects or increased risk is an ongoing process at the PMRA, which includes reassessing previous conclusions as necessary should new information or incidents be reported at a later date. In cases where mitigation strategies were adopted, the PMRA monitors the incident report data to determine if the actions were effective in reducing the identified risk. For example, there was a decrease in the number of Canadian domestic animal incidents involving rodenticides reported in 2012 compared to previous years. It is likely that this decrease can be partially attributed to the many risk mitigation measures that the PMRA required for eight rodenticides (Re-evaluation Note REV2010-17, Risk Mitigation Measures for Eight Rodenticides). Pesticide companies were given until the end of 2012 to comply with the required changes.

In 2012, the PMRA embarked on an Incident Reporting Regulations education project with pesticide companies who have not submitted an incident report to the PMRA. According to these companies, barriers to complying with the Regulations included not having established systems in place to fulfill the reporting requirements as well as not being aware of the Regulations. The PMRA is following up with these companies to promote and facilitate compliance.

2.0 Introduction

The federal government regulates pesticides under the Pest Control Products Act, which is administered by the PMRA. Under the Act, Health Canada determines which pesticides can be registered for use in Canada through a series of detailed, science-based evaluations that assess a pesticide's potential risk to human health and the environment and its effectiveness (value) for the intended use. Pesticides are registered by Health Canada if the risks to human health and the environment are determined to be acceptable and the product has value. Following the registration of pesticides, the PMRA continues to monitor the safety of these products by collecting and evaluating reports of incidents related to them.

As of the end of 2012, more than 8500 incident reports had been submitted to the PMRA since the program began. This review summarizes the incident reports received from 1 January to 31 December 2012 and provides details of the PMRA's evaluations.

2.1 Pesticide Incidents

A pesticide incident is any unintended effect to human health, domestic animal health or the environment resulting from exposure to a pesticide. It also includes packaging failure that could result in human exposure or injury, excessive residues in food, and scientific studies that indicate a new hazard or increased risk.

Incidents are further classified by severity based on the criteria outlined in the Pest Control Products Incident Reporting Regulations. Human and domestic animal incidents are categorized as one of the four severity levels: death, major, moderate and minor. Minor incidents include symptoms that are minimally bothersome and resolve rapidly without medical treatment (for example, headache). Moderate incidents include symptoms that are more pronounced or prolonged than minor symptoms, and that may require some form of medical treatment. Major incidents include symptoms that could be life-threatening or result in chronic disability (for example, respiratory failure or permanent eye damage). For environment incidents, there are three severity classifications: major, moderate and minor. These severity classifications are determined based on the type and number of organisms affected.

2.2 Reporting a Pesticide Incident

While registrants of pest control products have a legal obligation to report all information that they receive about an incident that relates to their product(s), anyone can report a suspected pesticide incident to the PMRA, including the general public, farmers and medical professionals. The PMRA encourages the reporting of all pesticide incidents. This includes incidents resulting from off-label use of the pesticide (where instructions for use were not correctly followed) or reporting of adverse effects that are already indicated on the product label. Incidents related to off-label use have occasionally highlighted issues with registered products, such as the mis-use of dog products containing permethrin on cats.

Pesticide companies are required to report all incidents that occur in Canada and a subset of incidents that occur in the United States. This subset includes incidents classified as human death, human major and domestic animal death. As such, the number of American incidents reported to the PMRA does not reflect the total number of incidents that are reported to authorities in the United States.

Submitted pesticide incident reports are made available through the Health Canada website on the PMRA public registry (http://pr-rp.hc-sc.gc.ca/pi-ip/index-eng.php).

2.3 The Use of Pesticide Incident Data

Health Canada uses incident report data to identify and characterize potential risk to humans, domestic animals and the environment from the real life use of pesticides.

The PMRA assesses the entire collection of incident report data with a particular focus on:

- serious adverse effects, and
- clusters of incident reports involving a particular pesticide.

A critical piece of the evaluation process is the determination of whether the pesticide product could have caused the reported effect. The likelihood that the pesticide caused the adverse effect is classified in terms of possible, probable, highly probable, unlikely, unrelated and insufficient information (see Appendix I for definitions). These causality levels are based on elements such as the:

- likelihood that exposure to the pesticide occurred;
- consistency of the reported effects with the known toxicity of the pesticide based on scientific studies and poisoning data;
- type, onset and duration of symptoms relative to the route, timing and duration of exposure to the pesticide; and
- repetition of effects in other incidents.

Incidents classified as possible, probable or highly probable are used as part of a weight of evidence approach to evaluate pesticide risk. Information from many different sources, such as scientific studies, poisoning data and pesticide sales data are all considered and integrated into the risk assessment process.

It is important to keep in mind that evaluations can vary in scope, depending on aspects such as the amount of information that is available and the complexity of the issue. Moreover, limitations associated with the reported incident are also taken into consideration. For example, the information provided in the report is unsubstantiated and often incomplete, and adverse effects reported may also be caused by non-pesticide related factors. Reporting of a particular effect does not necessarily mean that it was caused by the pesticide. On the other hand, there is likely under-reporting of pesticide incidents, which can present challenges (for example, the absence of incident reports cannot be used to validate the safety of a pesticide). Therefore, the potential impact of under-reporting is also considered when characterizing the risk.

Once a risk is characterized, the next step involves determining what actions can be taken to mitigate the risk. Possible actions for mitigating risk include, but are not limited to:

- amending the conditions of a product registration, such as requiring changes to label instructions;
- referring the incident to the Compliance Section for investigation;
- providing educational activities to promote the proper use of pesticides; or
- modifying product packaging.

Assessment of the incidents reported in 2012 led to several risk management actions by the PMRA including: the revision of label instructions, development of best practices for farmers, and the continued monitoring of adverse effects related to particular pesticides. Details of the assessments and corresponding actions are discussed below.

Monitoring incidents for unanticipated effects or increased potential risk is an ongoing process at the PMRA that includes re-assessing previous conclusions, as necessary. In cases where mitigation strategies were adopted, the PMRA also monitors the incident report data to determine if the actions were effective in managing the identified risk (see Section 4 for further details).

3.0 Incident Reports Received in 2012

3.1 General Analysis

In 2012, the PMRA received 1960 pesticide incident reports. Although most incidents were reported by pesticide companies (94%), a few incident reports (6%) were submitted by members of the public. There were 1385 incidents that occurred in Canada (71%), and 527 incidents that occurred in the United States (27%). The remaining 2% are scientific studies. Since Canadian pesticide companies are only required to report human deaths, human major incidents or domestic animal deaths that have occurred in the United States, the number reported above represents only a subset of incidents occurring in the United States.

The incidents that occurred in Canada involved 272 pesticide products: 52% were insecticides, 24% herbicides, 19% acaricides, 11% fungicides and 3% were insect repellents (note, some products belong to more than one pesticide group). There was a drop in the number of products belonging to the rodenticide group in 2012 when compared to previous years (see Section 4).

Pesticide incidents occurred in all 10 provinces. More than half of the number of Canadian incidents occurred in the Province of Ontario (51%). However, Saskatchewan had the highest rate of incidents relative to the size of the population.

The incident reports submitted in 2012 were mainly categorized as domestic animal incidents followed by human, environment, packaging failure and scientific study incidents. Further details are provided in the following sections.

3.2 Summary of 2012 Human Incident Reports

In 2012, the PMRA received 247 human incident reports involving 266 individuals (some reports involved more than one person). Most incidents were attributed to the application of pesticides either inside or outside the home (78%). Premise and carpet sprays containing the active ingredients belonging to the pyrethrin or synthetic pyrethroid groups accounted for a number of these incidents (21%). As in previous years, the number of males affected in pesticide incidents (59%) was slightly higher than females.

Most incidents involved adults aged 19 to 64 years. Infants and children (less than 12 years of age) made up 10% of all affected individuals, while seniors (greater than 64 years of age) accounted for 13%. In children and infants, activities resulting in exposure to the product often

occurred through contact with an area that had been treated with a pesticide (38%). Meanwhile, in adults and seniors, application of the product was reported as the most common activity resulting in pesticide exposure (58% and 61%, respectively). The primary route of exposure to the pesticide across all age groups was dermal, followed by inhalation.

Incidents resulting from the use of pesticides in occupational scenarios made up 14% of reports. Exposure in these incidents was reported to occur via activities relating to application of the pesticide, drift from application site or pesticide spills.

In most individuals, the symptoms developed fairly quickly following pesticide exposure (that is, within 24 hours). The gastrointestinal system and skin were the primary areas affected. Skin effects were more prevalent in children and seniors when compared to adults between 19 and 64 years of age.

The symptoms reported in human incidents were generally minor in nature (77%) while moderate effects were noted in 13% of incidents. The most frequently reported symptoms included: eye irritation, headache, nausea, skin irritation, shortness of breath, or coughing.

Major effects were noted in 34 individuals and death was reported in four individuals. These incidents mainly occurred in the United States; two incidents, involving major effects, occurred in Canada.

Potential health risks were identified for three pesticides: metofluthrin, chloropicrin and N, N-diethyl-m-toluamide (DEET). These incidents were further investigated and a brief summary of the patterns associated with these incidents and corresponding PMRA actions are outlined below.

Metofluthrin

The product, OFF! Clip-on Mosquito Repellent (Pest Control Product Registration Number 30211), containing the active ingredient metofluthrin, was registered for use as a personal insect repellent in October of 2011. When using this product, metofluthrin is vaporized into the air surrounding the user in order to repel mosquitoes. Within the first year of its registration, the PMRA received six human incident reports associated with this product. A wide range of symptoms such as dizziness, swelling, nausea, lethargy, muscular weakness, pruritus, irregular heart rate, or loss of consciousness was noted. The effects reported were considered to be either possibly or probably related to pesticide exposure. The product currently holds a registration that is conditional upon the submission of additional data on product exposure. Although only a few incidents were reported, this is a new product and the PMRA will continue to monitor incidents reported in the following year.

Chloropicrin

There were three incidents that occurred in June 2012 in Ontario in which the drift of a chloropicrin product resulted in the evacuation of nearby residences. All three incidents involved the restricted class soil fumigant Pic Plus Fumigant (Pest Control Product Registration Number 28751), and the circumstances of each incident were very similar. In each case, the product had

been applied to ginseng fields, and the incidents occurred later that evening. Residents near the treated fields reported experiencing stinging eyes, nasal congestion, coughing and lung congestion. Several people required emergency medical treatment. All nearby residences were evacuated for up to 12 hours, and, in one case, the highway was closed.

Chloropicrin is volatile and movement off-site can occur under certain weather conditions. In these incidents, it is likely that a thermal inversion occurred, which would have resulted in the vapour being trapped close to the ground instead of dissipating upwards towards cooler air. Chloropicrin is a lachrymator that also affects the respiratory tract. The PMRA evaluated the incidents and determined that their association with the reported pesticide exposure was "highly probable". No incidents involving chloropicrin were reported prior to 2012.

The Ontario Ministry of Environment investigated the incidents and determined that the product had been applied according to label instructions in each case. This was the first season that this product was used on ginseng.

Following the re-evaluation of soil fumigants, in 2012 the PMRA made extensive amendments to the product label for the purposes of limiting user exposure and protecting bystanders and the environment (REV2012-09, *Label Amendments for Soil Fumigants Products Containing Chloropicrin*). Some of these changes include restricting the use of the product under certain weather conditions, requirements for reducing the release of fumigant from soil and mandatory buffer zones around treated fields which, in the event of fumigant release, allows the fumigant to dissipate before reaching residential areas. All of these factors are designed to reduce the potential of exposure to the product.

N, N-diethyl-m-toluamide (DEET)

The active ingredient DEET consistently appeared as one of most frequently reported active ingredients in human incidents from 2007 to 2011. Children seemed to be implicated in a high number of these incidents. A review of all human incidents reported to the PMRA involving the active ingredient DEET was initiated in 2012.

Human incidents involving DEET were largely minor in severity. The products reported in these incidents were domestic class insect repellent sprays containing 15% or 25% DEET. There was a fairly high degree of association between the symptoms reported and exposure to a DEET insect repellent. This was due to the prevalence of direct exposure to the product, either via the skin or eye, resulting in irritation shortly after exposure as well as the occurrence of mild respiratory or general reactions (for example, headache or nausea) soon after product application.

Most exposures were very short in duration (less than 15 minutes) and resulted in symptoms, within 24 hours of exposure, which resolved within one week. The majority of the incidents (>95%) occurred after dermal or ocular exposure to the product. Despite product label directions to avoid contact with eyes and to keep the products out of reach of children, several incidents involved direct ocular exposure and/or children handling or applying DEET insect repellents.

Overall, the assessment of human incident reports involving DEET did not identify any significant health effects. The results of the DEET analysis will be incorporated into communication materials intended for consumers. Recommendations include advising parents that children not be allowed to apply or handle DEET insect repellents.

3.3 Summary of 2012 Domestic Animal Incident Reports

In 2012, 1407 domestic animal reports were received by the PMRA. Sixty-five percent of reported incidents occurred in Canada while the remainder occurred in the United States. Most domestic animal incidents involved cats (40%) or dogs (57%).

Overall, in 2012 there was an increase in the number of domestic animal incidents when compared to previous years. This increase can be attributed, in part, to the outreach efforts conducted by Health Canada. Beginning in 2011 and continuing in 2012, Health Canada collaborated with the Canadian Veterinary Medical Association (CVMA) to disseminate the message to provincial veterinary associations concerning the importance of incident reporting. As a result of this outreach, reports from veterinarians increased by 47% in 2012.

The majority of reports involved animals that were treated with a dermal application of a pesticide for the control of fleas and ticks (68%). Other sources of exposure include contact with a treated area or accidental exposure via ingestion of a product, (24% of incidents). Insecticide was the most common type of pesticide reported followed by herbicide.

Most animals experienced minor symptoms following exposure to a pesticide (59%). Moderate symptoms were noted in 18% of animals. In Canadian incidents, major effects or death were noted in 10% of affected animals. The primary symptoms reported included gastrointestinal effects (for example, vomiting, anorexia and drooling), general effects (for example, lethargy and abnormal behaviour) or nervous and muscular system effects (for example, tremor and convulsions).

Other types of animals that were reported in 2012 included horses, cows and birds. In incidents involving horses and cows, exposure to pesticides mainly occurred as a result of treatment of the animal with pour-on type insecticides, while in birds, exposure was commonly noted via contact with a pesticide treated area of land. No other patterns were discerned in the data due to the small number of incidents reported for these types of animals.

Overall, dermally applied products for the control of fleas and ticks (in other words, spot-on type products) continue to feature prominently in domestic animal incidents. An analysis of incidents associated with the use of these products was conducted in 2009, resulting in the publication of an advisory as well as a regulatory directive (DIR2010-02, *Label Improvements for Spot-on Pesticides Used for Flea and Tick Control on Companion Animals*). Label amendments outlined in DIR2010-02 were required to be implemented by pesticide companies by June 2011, and included statements that prevented the use of, and exposure to, spot-on type products containing permethrin on cats, as well as wording to make consumers aware of potential sensitivities of smaller animals to spot-on type products. Despite these actions, there has been a steady increase in the volume of incidents associated with these product types. A thorough evaluation focusing

on product dosage has been initiated in order to minimize risks associated with the use of these products.

Assessments of incidents not associated with a dermally applied flea and tick control product did not point to any significant health concerns. The label of one pesticide product containing azoxystrobin was modified slightly to minimize exposure.

3.4 Summary of 2012 Environment Incident Reports

In 2012, there was an increase in the number of honey bee mortalities that were reported to the PMRA. There was also a slight increase in the number of incidents reporting effects on herbaceous plants.

The PMRA conducted an extensive investigation of the honey bee mortalities that were received in the spring and summer of 2012. Information considered during this evaluation included reports from beekeepers and follow-up investigations conducted by Health Canada, the Ontario Ministry of the Environment, and the Ontario Ministry of Agriculture and Farms. During the evaluation, factors considered included timing of application of pesticides, pesticide residues in the bees, bee colony health, agriculture practices surrounding the bee yards, and the weather. The PMRA concluded that planting of corn seeds treated with neonicotionid pesticides contributed to the majority of the reported bee mortalities, with the likely route of exposure being insecticide contaminated dust generated during the planting of treated corn seed. The unusual weather conditions in the spring of 2012 were also thought to be a contributing factor. Details of the evaluations can be found in the document *Evaluation of Canadian Bee Mortalities that Coincided with Corn Planting in Spring 2012*.

As a result of the investigation, the PMRA developed Best Management Practices to help reduce honey bee exposure to dust generated during planting of treated corn seed before the 2013 planting season. These practices were communicated to both growers in the region as well as beekeepers through an outreach program developed and implemented by the PMRA. Longer-term measures were also initiated, including labelling of treated seed, a treated seed dust standard, and development of technical solutions to reduce dust (developments in the areas of seed coating quality, seed flow lubricants, planting equipment, and disposal of treated seed bags). Additional information is available in the PMRA document Pollinator Protection: Reducing Risk from Treated Seed.

An interim evaluation of reports of bee mortalities received in 2013 is available, entitled Evaluation of Canadian Bee Mortalities in 2013 Related to Neonicotinoid Pesticides – Interim Report as of September 26, 2013. Further to the Best Management Practices proposed following the 2012 incidents, the PMRA has released a Notice of Intent that outlines additional measures to reduce bee exposure to neonicotinoid pesticides during the planting of treated corn and soybean seeds. The evaluation of bee mortalities in Canada continues to be a priority for the PMRA.

3.5 Summary of 2012 Packaging Failure Incident Reports

There were 69 packaging failure incidents reported to the PMRA in 2012. The packaging types involved in the highest number of incident reports were pressurized cans, followed by plastic bottles, spray bottles and plastic jugs. Four incidents also involved human injury. Assessment of the packaging failure incidents did not identify any significant issues.

4.0 Retrospective Analysis: the Effectiveness of Regulatory Actions

Incident reports can also be used to monitor the effectiveness of risk mitigation measures that were taken in response to a health or environmental concern associated with the use of a particular pesticide or product group.

4.1 Rodenticides

To reduce risks to children, pets and non-target wildlife from the use of rodenticides, the PMRA required new safety measures to eight rodenticides: warfarin, chlorophacinone, diphacinone, brodifacoum, bromadiolone, zinc phosphide, difethialone and bromethalin (REV2010-17). Measures included requiring domestic class products to be sold packaged with ready-to-use tamper resistant bait stations, and prohibiting second-generation anticoagulants and loose bait (pelleted, meal, liquid, etc.) in domestic class products. Pesticide companies were given until the end of 2012 to comply with the required changes.

Incidents reported to the PMRA from 2007 to 2011 for rodenticide products were primarily domestic animal incidents, involving dogs that ate the product. Over 10% of Canadian incidents resulted in serious effects or death. Fifty percent of the incidents involved domestic products containing second-generation anticoagulants, and 35% involved products formulated as loose bait. Some human incidents were also reported. Most of the effects were classified as minor and resulted from the inhalation of dust from products formulated as loose bait, or from dermal contact with the product.

In 2012, Canadian rodenticide-related incident reports decreased 37% compared to previous years. This decrease was mainly noted in domestic animal incidents involving the second-generation anti-coagulants bromadiolone and difethialone.

The reduction in the number of incident reports highlights the potential impact of the required mitigation measures. The PMRA will continue to monitor the situation.

4.2 Corrective measures adopted for packaging failures

In 2010, a large number of packaging failure incidents associated with the active ingredient DEET were reported. The PMRA identified an issue with the packaging of the product OFF! Family Care Insect Repellent Smooth and Dry (Pest Control Product Registration Number 28648). The pesticide company proactively changed the product package to prevent further leaks. A significant decline in incidents involving this product was observed in 2011. In 2012, the number of incidents reported continued to be low and was in proportion with other DEET products, indicating that the packaging issue had been addressed.

The product Broadband Herbicide (Pest Control Product Registration Number 29138) was reported for the first time in packaging failure incidents in 2011, which involved a large number of defective metal drums. Given the number of defective drums (61 drums), as well as the volume of product in each drum (85 litres), the potential for health or environmental concerns resulting from a leak was considered to be unacceptable. The company took corrective action by changing the vent of the drum. No incidents of packaging failure for this product were reported in 2012, indicating the issue has been addressed.

4.3 Metarhizium anisopliae Strain F52

In 2011, the PMRA received one incident report involving seven individuals working at a plant that manufactures the active ingredient *Metarhizium anisopliae* strain F52. The workers experienced various symptoms such as: headache, dizziness, skin irritation, vomiting, fatigue, breathing difficulties, coughing or nosebleeds, over a period of seven months. In all cases, the route of exposure was inhalation. In five out of the seven cases, faulty or inappropriate respiratory protection was noted. As a result of this incident, the pesticide company implemented extensive measures at the plant aimed at decreasing exposure. These included: upgrading the production line air handling system, requiring employees to wear a powered air purifying respirator and Tyvek suit fitted with a hood, implementing mandatory safety training for all employees, hiring a contractor to provide personal protective equipment training, as well as instituting a 'buddy' system to verify correct use of personal protective equipment.

In 2012, one minor incident involving one individual occurred at the same manufacturing plant. According to the report, the worker experienced symptoms like nose-bleed, stinging, numbness and respiratory pain. The worker was not wearing the proper personal protective equipment. This incident was determined to be probably related to the pesticide. As a result of this incident, the pesticide company provided additional training on proper personal protective equipment to the worker affected in the incident, as well as to other staff. Also, the company provided increased signage at the entry to the manufacturing location. The decrease in incidents at this facility indicates that mitigation strategies implemented by the company are working towards preventing incidents from occurring. The PMRA will continue to monitor incident data associated with this product.

5.0 Compliance with the Incident Reporting Regulations

Ensuring compliance with the Incident Reporting Regulations is an important aspect of the PMRA's Incident Reporting program. In 2012, the PMRA conducted an education outreach initiative with pesticide companies who had never reported an incident. The focus was commercial class pesticides. The PMRA conducted an on-site interview with all companies who met the above criteria. They were queried on their knowledge of the regulations as well as the systems they had in place to receive and submit incidents.

A total of 41 pesticide companies were interviewed during this initiative. The majority of the pesticide companies stated that they had not been informed of any adverse reactions or concerns related to any of their pesticides. A little over one-half of these companies also indicated a high

level of awareness and understanding of the Incident Reporting Regulations. There were a few (six pesticide companies) that did indicate receiving an adverse reaction associated with one of their products. They did not submit the incident to the PMRA because they had no established reporting process in place. Some companies were not aware of all incident reporting requirements. The PMRA is currently working with these pesticide companies to ensure that they are aware of the requirements and that all incidents associated with their products are submitted.

The PMRA will continue its outreach effort with pesticide companies, as well as various consumer groups, to inform both companies and users on the importance of reporting pesticide incidents.

6.0 Conclusions

The Incident Reporting Program analyzed the entire collection of incident report data in 2012. As in previous years, minor incidents involving a large variety of domestic class pesticides continued to be the most frequently submitted reports. Most of these incidents occurred either during application of a pesticide or via contact with a treated area.

Some assessments of the 2012 incident reports led to regulatory action to mitigate potential risks. Notably, the use of chloropicrin had to be modified significantly due to human health concerns. As well, the PMRA concluded that planting of corn seeds treated with neonicotinoid pesticides contributed to the majority of the reported bee mortalities, warranting actions to reduce exposure to dust generated during planting.

Dermally applied spot-on type products for the control of fleas and ticks continue to figure prominently in domestic animal incidents. A thorough evaluation, focused on product dosage, has been initiated in order to minimize risks associated with the use of these products.
A noticeable decrease in the number of incidents involving rodenticides compared to previous years illustrates the impact of the risk mitigation measures that were recently put in place for these products.

7.0 Preventing Pesticide Incidents: Follow Label Directions

Product labels specify the correct use of the product so that risks to human health and the environment are minimized. The label is a legal document that must be followed. Outlined below are examples of incidents that occurred because pesticide labels were not followed.

1. Do not apply pesticides directly to people or animals except when directed to do so on the label.

Two children were exposed to a product (Raid House and Garden Bug Killer) when it was applied to their clothes and skin from the neck down. The caller reported that one child coughed all through the night and developed blisters on his back two days later.

2. Make sure the pesticide can be used on the area you intend to treat. For example, do not apply a product to a mattress if that use is not indicated on the label.

A person applied a pesticide product on her mattress that was only registered for crack and crevice treatment. She developed shortness of breath, chest tightness and dry throat and dry eyes later that evening. She slept on the bed that night and the symptoms persisted during the night before eventually subsiding.

8.0 How to Report Pesticide Incidents

There are two ways to report pesticide incidents:

1. Contact the pesticide company using the information on the product label. They are required by law to report all incidents related to their products to Health Canada.

2. Go to Health Canada's Report a Pesticide Incident webpage at www.healthcanada.gc.ca/pesticideincident and fill out one of the forms under the section called "How to report a pesticide incident." If you have any questions about the forms, or need help filling them out, call Health Canada at 1-800-267-6315 (within Canada) or 1-613-736-3799 (outside of Canada) or email us at PMRA-incident-ARLA@hc-sc.gc.ca.

More information is available on Health Canada's Report a Pesticide Incident webpage at www.healthcanada.gc.ca/pesticideincident.

Appendix 1: Definitions of Causality Levels

Causality Level	Definition
Highly probable	The circumstances of the incident or confirmatory evidence, such as residue analysis or medical testing, indicate that exposure to the pesticide definitely occurred, and knowledge of the properties of the pesticide or history of previous incidents give strong support that the pesticide was the cause.
Probable	The circumstances of the incident and properties of the pesticide or history of previous incidents give strong support that this pesticide was the cause, but information confirming exposure to the pesticide is lacking.
Possible	Information may be ambiguous, although there is some correlation between the pesticide and the effect. The pesticide could have caused the effect, but there are other explanations that are at least as plausible. This level of causality is often used when an incident involves more than one pesticide and information confirming exposure to the pesticide is lacking.
Unlikely	Evidence exists that factors other than exposure to the pesticide caused the incident, but the evidence is not conclusive, or the effect reported is not typical for the pesticide. However, the possibility that exposure to the pesticide caused the effect cannot be ruled out.
Unrelated	Conclusive evidence demonstrates the effect was caused by factors other than the pesticide, or the effect occurred before exposure to the pesticide.
Insufficient Information	The information available regarding the reported exposure or effect is insufficient or conflicting such that a determination as to whether the effects were related to a pesticide exposure cannot be made.